

CLAIMS

1. A vaporizer that vaporizes a liquid to generate vapor, comprising:
a plurality of heating gas flow paths through which heating gas circulates;
a plurality of vaporization flow paths that are provided with bottoms and are located such that they can exchange heat with the heating gas flow paths, and that vaporize the liquid that is supplied from above in the direction of gravity, and that discharge the vaporized vapor upwards in the direction of gravity; and
a plurality of fins that are provided on an inner surface of the vaporization flow paths.
2. The vaporizer according to claim 1, wherein the plurality of heating gas flow paths and the plurality of vaporization flow paths are placed so as to alternate with each other.
3. The vaporizer according to claim 1, wherein at least a portion of each of the plurality of heating gas flow paths is provided in a substantially orthogonal direction relative to the plurality of vaporization flow paths.
4. The vaporizer according to claim 1, wherein the plurality of fins are provided in a plurality of steps running in the direction of gravity, and fins in one step are placed so as to be offset from fins in adjacent steps.
5. The vaporizer according to claim 1, wherein there is further provided a porous material that is placed on a top side of the bottoms of the plurality of vaporization flow

paths, and a heating apparatus that is placed on a bottom side of the bottoms.

6. The vaporizer according to claim 1, wherein there are further provided liquid supply pipes that are placed above the plurality of vaporization flow paths, and a plurality of supply holes through which the liquid drips are provided in the liquid supply pipes.

7. The vaporizer according to claim 1, wherein the liquid is a liquid fuel containing a hydrocarbon, and the vapor is a fuel vapor used for fuel reformation.

8. A vaporizer that vaporizes a liquid to generate vapor, comprising:
a heating gas direct movement flow path along which heating gas flows by moving directly in a horizontal direction;
a vaporization section that is positioned such that it can exchange heat with the heating gas direct movement flow path, and that vaporizes the liquid and causes the vapor therefrom to flow upwards in the direction of gravity;
a liquid supply section that supplies the liquid to the vaporization section; and
a superheating section that is positioned in an upstream portion on the heating gas direct movement flow path from the vaporization section such that it can exchange heat with the heating gas direct movement flow path, and that places the vapor that is discharged from the top portion of the vaporization section in a superheated state, wherein
the superheating section is provided with a vapor flow path that is connected with the top portion of the vaporization section and that causes the vapor to circulate.

9. The vaporizer according to claim 8, wherein the vapor flow path of the superheating section is formed so as to intersect with the flow of the heating gas a plurality of times.
10. The vaporizer according to claim 8, wherein there is provided a temperature control section that is placed around the vaporization section and is connected to a discharge aperture of the heating gas direct movement flow path, and the temperature control section is provided with a bottom portion flow path into which the heating gas discharged from the heating gas direct movement flow path is introduced.
11. The vaporizer according to claim 8, wherein the temperature control section is provided with a side flow path that causes the heating gas introduced into the bottom portion flow path to circle around a side of the vaporization section and then rise upwards.
12. The vaporizer according to claim 8, wherein there is provided a thermal insulation chamber that is placed around the superheating section.
13. The vaporizer according to claim 8, wherein a catalyst is provided in an interior of the heating gas direct movement flow path.
14. The vaporizer according to claim 8, wherein a first catalyst is provided in the interior of the heating gas direct movement flow path at a position where it can exchange heat with the superheating section, and a second catalyst is provided in the interior of the heating gas direct movement flow path at a position where it can exchange heat with the

vaporizing section.

15. The vaporizer according to claim 14, wherein the heating gas is obtained by burning off gas that is discharged from a fuel cell, the first catalyst is an oxidation catalyst, and the second catalyst is an emission purifying catalyst.

16. The vaporizer according to claim 8, wherein the liquid is a liquid fuel that contains a hydrocarbon, and the vapor is a fuel vapor used for reforming fuel.